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PATENT COOPERATION TREATY

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NOTIFICATION CONCERNING
TRANSMITTAL OF COPY OF INTERNATIONAL
PRELIMINARY REPORT ON PATENTABILITY
(CHAPTER I OF THE PATENT COOPERATION
TREATY)

(PCT Rule 44bis.1(c))

To:

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Applicant's or agent's file reference

ART049PCT

GROSSMAN, TUCKER,
PERREAULT & PFLEGER, PLLC

IMPORTANT NOTICE

International application No.

PCT/US2010/025095

International filing date (day/month/year)

23 February 2010 (23.02.2010)

Priority date (day/month/year)

23 February 2009 (23.02.2009)

Applicant

ARTHROSURFACE INCORPORATED et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference ART049PCT	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2010/025095	International filing date (<i>day/month/year</i>) 23 February 2010 (23.02.2010)	Priority date (<i>day/month/year</i>) 23 February 2009 (23.02.2009)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant ARTHROSURFACE INCORPORATED			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70		Date of issuance of this report 23 August 2011 (23.08.2011) Authorized officer Philippe Becamel e-mail: pt12.pct@wipo.int
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: STEPHEN FINCH GROSSMAN, TUCKER, PERREAULT & PFLEGER, PLLC 55 SO. COMMERCIAL ST. MANCHESTER, NH 03101		Date of mailing (day/month/year) 21 APR 2010
Applicant's or agent's file reference ART049PCT		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/US2010/025095	International filing date (day/month/year) 23 February 2010	Priority date (day/month/year) 23 February 2009
International Patent Classification (IPC) or both national classification and IPC IPC(8) - A61F 2/38 (2010.01) USPC - 623/20.14		
Applicant ARTHROSURFACE INCORPORATED		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis. 1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Date of completion of this opinion 08 April 2010	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2010/025095

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:
☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
☐ on paper
☐ in electronic form
 - b. (time)
☐ in the international application as filed
☐ together with the international application in electronic form
☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2010/025095

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2, 5 and 8 lack an inventive step under PCT Article 33(3) as being obvious over Ek in view of Wen et al.

Referring to claim 1, Ek discloses a joint prosthesis (40) (Abstract; Fig. 1) comprising: a first surface (42) having a curvature that substantially matches the contour of native articular surface (col. 13, lines 16-29; Figs. 1, 4a-4c, 5a, 5b), said first surface comprising a cobalt chromium alloy (col. 25, lines 13-17); and said first surface including a plurality of features (43) (Fig. 4c). However, Ek does not show a prosthesis comprising: an average surface feature size of between 10 and 30 nm. However, Wen et al. teaches a prosthesis (Abstract) comprising: a surface having a nanoscale feature size (paragraphs [0050], [0058]) for the purpose of facilitating acceptance of tissue and bone growth or apposition after implantation (Abstract). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek to include a prosthesis comprising: an average surface feature size of between 10 and 30 nm for the purpose of providing adequate adherence between a bioactive coating and an implant, facilitating acceptance of tissue and bone growth or apposition after implantation and since such a modification would involve a mere change in the size of a component.

Referring to claim 2, Ek discloses that as applied to claim 1. However, Ek does not show a prosthesis wherein the first surface comprises features that are substantially spherical and about 20 nm in size. However, Wen et al. teaches a prosthesis (Abstract) comprising: a surface having a nanoscale feature size (paragraphs [0050], [0058]) for the purpose of facilitating acceptance of tissue and bone growth or apposition after implantation (Abstract). It would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek to include a prosthesis wherein the first surface comprises features that are substantially spherical and about 20 nm in size for the purpose of providing adequate adherence between a bioactive coating and an implant, facilitating acceptance of tissue and bone growth or apposition after implantation and since such a modification would involve a mere change in the size of a component and since a change in shape of an element involves only routine skill in the art.

Referring to claim 5, Ek discloses that as applied to claim 1. Ek further discloses a prosthesis wherein the prosthesis is affixed to bone tissue in a human patient (Fig. 1).

Referring to claim 8, Ek discloses that as applied to claim 1. Ek further discloses a prosthesis wherein the prosthesis is a knee prosthesis (Fig. 1).

Claim 9 lacks an inventive step under PCT Article 33(3) as being obvious over Ek in view of Webster et al.

Referring to claim 9, Ek discloses a prosthesis (40) for supporting the growth of mammalian cells (Abstract; col. 13, lines 54-60; Fig. 1), the prosthesis comprising a cobalt chromium alloy surface (42) (col. 13, lines 16-29; col. 25, lines 13-17; Figs. 1, 4a-4c, 5a, 5b). However, Ek does not show a prosthesis comprising a surface energy of greater than 30mJ/m². However, Webster et al. teaches a prosthesis (Abstract) comprising a surface energy of greater than 30mJ/m² (paragraphs [0048], [0049]). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek to include a prosthesis comprising a surface energy of greater than 30mJ/m² as taught by Webster et al. for the purpose of increasing the implants bonding strength.

Claims 16-18 lack an inventive step under PCT Article 33(3) as being obvious over Ek in view of Denzer et al.

Referring to claim 16, Ek discloses a prosthesis (40) for supporting mammalian cells (Abstract; Fig. 1), the prosthesis comprising a contoured surface (42) comprising a cobalt chromium alloy (col. 13, lines 16-29; col. 25, lines 13-17; Figs. 1, 4a-4c, 5a, 5b). However, Ek does not show a prosthesis comprising a wet contact angle of less than about 60 degrees. However, Denzer et al. teaches a prosthesis (Abstract) comprising a wet contact angle of less than about 60 degrees (paragraphs [0006], [0018], [0030]). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek to include a prosthesis comprising a wet contact angle of less than about 60 degrees as taught by Denzer et al. for the purpose of improving the osteointegration properties of the implant.

Referring to claim 17, Ek discloses that as applied to claim 16. However, Ek does not show a prosthesis wherein the wet contact angle is less than about 45 degrees. However, Denzer et al. teaches a prosthesis wherein the wet contact angle is less than about 45 degrees (paragraphs [0006], [0018], [0030]). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek to include a prosthesis wherein the wet contact angle is less than about 45 degrees as taught by Denzer et al. for the purpose of improving the osteointegration properties of the implant.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Referring to claim 18, Ek discloses that as applied to claim 16. However, Ek does not show a prosthesis wherein the wet contact angle is less than about 45 degrees. However, Denzer et al. teaches a prosthesis wherein the wet contact angle is less than about 20 degrees (paragraphs [0006], [0018], [0030]). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek to include a prosthesis wherein the wet contact angle is less than about 45 degrees as taught by Denzer et al. for the purpose of improving the osteointegration properties of the implant.

Claims 3, 4, 6 and 7 lack an inventive step under PCT Article 33(3) as being obvious over Ek in view of Wen et al. In view of Schwartz et al.

Referring to claim 3, Ek in view of Wen et al. discloses that as applied to claim 1. However, Ek in view of Wen et al. does not show a prosthesis further comprising a layer of mammalian cells on a first surface. However, Schwartz et al. teaches a prosthesis (22) (Abstract; Fig. 4) further comprising a layer of mammalian cells (chondrocytes embedded in 28) on a first surface (lower 22) (col. 8, lines 41-48; col. 12, lines 29-60; Fig. 4). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek in view of Wen et al. to include a prosthesis further comprising a layer of mammalian cells on a first surface as taught by Schwartz et al. for the purpose of expediting the healing of damaged cartilage.

Referring to claim 4, Ek in view of Wen et al. discloses that as applied to claim 1. However, Ek in view of Wen et al. does not show a prosthesis further comprising a layer of human chondrocytes on a first surface. However, Schwartz et al. teaches a prosthesis (22) (Abstract; Fig. 4) further comprising a layer of human chondrocytes (embedded in 28) on a first surface (lower 22) (col. 2, lines 6-12; col. 8, lines 41-48; col. 12, lines 29-60; Fig. 4). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek in view of Wen et al. to include a prosthesis further comprising a layer of human chondrocytes on a first surface as taught by Schwartz et al. for the purpose of expediting the healing of damaged cartilage.

Referring to claim 6, Ek in view of Wen et al. discloses that as applied to claim 1. However, Ek in view of Wen et al. does not show a prosthesis wherein human cartilage is affixed to a first surface. However, Schwartz et al. teaches a prosthesis (22) (Abstract; Fig. 4) wherein human cartilage is affixed to a first surface (lower 22) (col. 2, lines 6-12; col. 8, lines 41-48; col. 12, lines 29-60; Fig. 4). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek in view of Wen et al. to include a prosthesis wherein human cartilage is affixed to a first surface as taught by Schwartz et al. for the purpose of expediting the healing of damaged cartilage.

Referring to claim 7, Ek in view of Wen et al. discloses that as applied to claim 6. Ek further discloses a prosthesis wherein the alloy further comprises molybdenum (col. 25, lines 13-17).

Claims 10-15 lack an inventive step under PCT Article 33(3) as being obvious over Ek in view of Webster et al. In view of Schwartz et al.

Referring to claim 10, Ek in view of Webster et al. discloses that as applied to claim 9. However, Ek in view of Webster et al. does not show a prosthesis wherein human chondrocytes are disposed on a surface. However, Schwartz et al. teaches a prosthesis (22) (Abstract; Fig. 4) wherein human chondrocytes are disposed on a surface (lower 22) (col. 2, lines 6-12; col. 8, lines 41-48; col. 12, lines 29-60; Fig. 4). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to modify the invention of Ek in view of Webster et al. to include a prosthesis wherein human chondrocytes are disposed on a surface as taught by Schwartz et al. for the purpose of expediting the healing of damaged cartilage.

Referring to claim 11, Ek in view of Webster et al. discloses that as applied to claim 9. Ek further discloses a prosthesis further comprising molybdenum (col. 25, lines 13-17).

Referring to claim 12, Ek in view of Webster et al. discloses that as applied to claim 9. Ek further discloses a prosthesis having a portion consisting essentially of a cobalt chromium alloy (col. 25, lines 13-17).

Referring to claim 13, Ek in view of Webster et al. discloses that as applied to claim 9. Ek further discloses a prosthesis having a portion consisting essentially of a cobalt chromium alloy doped with molybdenum (col. 25, lines 13-17).

Referring to claim 14, Ek in view of Webster et al. discloses that as applied to claim 9. Ek further discloses a prosthesis comprising a screw (10) for insertion into bone (Fig. 1).

Referring to claim 15, Ek in view of Webster et al. discloses that as applied to claim 14. Ek further discloses a prosthesis comprising a first portion (40) including a contoured surface (42) of cobalt chromium alloy (col. 25, lines 13-17; Fig. 4c) and a second portion including a titanium screw (720') (col. 29, lines 45-47; Figs. 47, 48).

Claims 1-18 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

